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THE BOTANICAL FEATURES OF THE NEW UNITED STATES PHARMACOPŒIA.

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THE eighth decennial revision of the United States Pharmacopœia, which has recently been published, is of interest to the chemist and botanist alike. In the pages of this legal standard there is contained a list of drugs derived from the vegetable kingdom. These drugs are from various parts of plants and the plants are distributed very widely over the globe. It is exceedingly interesting to the botanist to note that in the references made to botanical drugs an effort has been made in the recent revision, as far as possible, to restore the names given to the plants by the original authors. In some cases it has been almost impossible to make any such changes; for example, in our common wild cherry, which was made official in this standard work scores of years ago, and under the name of *Prunus virginiana*. It is well known that the botanical source of the medicinal wild cherry bark is from *Prunus serotina*. Therefore, the United States Pharmacopœia speaks of wild cherry as *Prunus virginiana* derived from the bark of *Prunus serotina*. Quite a number of changes have occurred in the new pharmacopœia resulting from the changes which investigation has made necessary in transferring plants into new families or natural orders. No less than twelve changes have been made by transferring plants into other orders than were formerly recognized as the proper order. In the case of Urticacæ, for example, in the pharmacopœia of 1890 the natural order Urticacæ included the following drugs: *Ulmus*, *Humulus*, *Cannabis indica*, *Ficus*. In the present pharmacopœia *Ulmus* is placed under the new order Ulmaceæ, and *Humulus* and *Cannabis indica* under the Moracacæ. Many of the plants and products of the pines that were formerly classified under the natural order Coniferæ are now classified under the family Pinaceæ. Examples of such changes as these, as I have said, are of interest to the botanist, and it goes to show that as old a science as botany claims to be, it is by no means incapable of change and improvement, when such changes as these are possible.

Under the description of drugs derived from the vegetable kingdom, the pharmacopœia shows strikingly the progress which has been made in microscopical botany. Descriptions of crude drugs requiring the use of the compound microscope are found repeatedly in the text. Scattered here and there in the text of the pharmacopœia are found such statements as the following, quoting a paragraph under *Althæa* (marshmallow): "The powder contains rosette-shaped crystals of calcium oxalate, about 0.025 mm. in diameter, and ellipsoidal starch grains from 0.010 to 0.020 mm. in diameter."

The measurement of the official (corn) starch is stated as from about 0.010 to 0.025 mm. in diameter, but these are usually polygonal grains. In elm bark there are noted a few nearly spherical starch grains measuring from 0.005 to 0.010 mm. in diameter. We frequently hear the statement made that lycopodium consists of the pollen of *Lycopodium clavatum.* The pharmacopœia states that these microscopical elements are tetrahedral spores, from 0.025 to 0.040 mm. in diameter, and are multicellular; and that the microscope should reveal neither pollen nor starch grains.

In the case of *Sinapis* (both black and white mustard seed) and in flaxseed, the presence of starch, while admitted, is not revealed by the microscope. In these cases a "limit test" for starch is given, which, in the case of the mustards, reads as follows: "If 1 gm. of the powder be exhausted by slow percolation with alcohol and the mass mixed with 200 c.c. of water and heated to boiling, and if, after cooling, sufficient cold water be added to make the mixture measure 1000 c.c., the addition of 4 c.c. of tenth-normal iodine t. s. should not produce a dark blue color."

In the case of flaxseed, the limit test is substantially the same, but varies from the former, as will be seen: "If 1 gm. of ground linseed be mixed with 20 c.c. of water and the mixture heated to boiling, then cooled and diluted with cold water to 100 c.c., the addition of 0.5 c.c. of iodine t. s. should not produce more than a pale blue color."

It is important to note in this connection also that the compound microscope is called into requisition in the identification of anatomical structures, as, for example, in the description of the barks derived from *Viburnum opulus* and *Viburnum prunifolium.* Under *V. opulus* it is stated that transverse sections of the bark show several bands of bast fibers; while in the case of the *prunifolium* the statement is met that the cross-sections show groups of stone cells. These elements are satisfactorily distinguishable only by the aid of a one-inch (better by a one-fifth) objective, and seem to distinguish the two barks, even in form of powder.

In the new edition of the pharmacopœia it is evident that the committee of revision have endeavored to express in as few words as possible the most essential characteristics of the drug. The descriptions of these characteristics have been compressed into an average space of about ten lines. In the case of the description of aniseed, we have the following statement: "Ovoid, laterally compressed, 4 to 5 mm. long; carpels usually cohering and attached to a slender pedicel; grayish to greenish gray to grayish brown; each with a flat face and five light brown filiform ridges and about sixteen oil-tubes; odor and taste agreeable and aromatic. No mouse-like odor should be developed when solution of potassium hydroxide is poured upon anise (absence of conium). The powder contains one-celled, straight or curved, non-secreting hairs, which vary from 0.025 to 0.100 mm. in length."

Those who are familiar with these substances know how important it is to distinguish anise from conium, a poisonous fruit from the same family; a fruit which is readily mistaken for the innocent, aromatic aniseed. It would be impossible in this paper to give anything like a satisfactory analysis of the botanical work of the present pharmacopœia. The detailed description of the changes and improvements would require a small volume, but it is the object of this paper to call attention not only to the pharmacopœia itself, but to the botanical features of it which botanists should be interested in. Indeed, all scientists who are interested in the progress of a national work, a work that is recognized by various state laws and by the United States government, should be interested in the reviewing of this recently revised standard for medicinal substances, whether from the point of view of the sciences connected with the vegetable, animal or mineral kingdom.